The Role of Self-Referent and Other-Referent Knowledge in Perceptions of Group Characteristics

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Research on social projection shows that perceptions of group characteristics depend, in part, on people's perceptions of themselves. According to the principles of inductive reasoning, however, knowledge of other individual group members should also predict perceptions of the group. The present studies directly compared the use of self- and other-referent knowledge. In Study 1, self-judgments predicted group judgments better than judgments about a familiar other person did. When differences in the accessibility and stability of self-referent and other-referent knowledge were controlled, the predictive advantage of self-referent knowledge disappeared. In Study 2, the other person was present during assessment (i.e., visually salient) and other judgments predicted group judgments as well as self-judgments did. Changes in social categorization, however, instead of increases in the individuation of the other person accounted for this finding. It is concluded that projection is best understood as an egocentric bias rather than a form of inductive reasoning.

People perceive considerable similarities between themselves and the groups to which they belong. These perceptions of similarity typically emerge as positive correlations between self-ratings and estimates of group characteristics (i.e., group ratings). How do these perceptions of similarity arise? Most of the evidence suggests that people's perceptions of their own characteristics guide their estimates of group characteristics. In other words, people seem to project their own characteristics onto the group. The inverse of this process, which may be termed *introjection* or *self-stereotyping*, has received less support (see Bauman & Ennett, 1996; Krueger, 1998a, 2000, for reviews).

Certainly, projected self-images cannot fully explain group ratings; knowledge of other individuals' characteristics also plays an important role. Again, however, perceived similarities between individual group members and the group at large can arise from two opposing processes. Perceivers may generalize the characteristics of known other individuals to the group, or they may use knowledge of group characteristics to infer or deduce characteristics of individual members (Krueger, in press). Such other stereotyping is most likely when the perceiver has strong expectations about or firm knowledge of group characteristics but knows little about the target individual (Krueger & Rothbart, 1988).

The self, other individuals, and the group form social-perceptual triangles, in which each side represents a perception of similarity. The third kind of perceived similarity involves the social perceivers themselves and other individual group members. These perceptions too may result from projection or introjection. Which of these two processes predominates depends again on the amount and the reliability of the available information about each target.

Our first research question was whether people perceive greater similarities between the self and the group or between another individual group member and the group. Judging from past research, we hypothesized that group ratings would be more closely related to self-ratings than to other ratings. We refer to this prediction as the social-projection hypothesis. The evidence for the egocentricity of projection suggests that people anchor

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their social predictions directly and without much thought on their own phenomenal experiences (Gilovich, Savitsky, & Medvec, 1998; Keysar, Barr, & Balin, 1998). For many sense perceptions, this heuristic yields excellent results. A moviegoer who finds the projection (in its technical sense) blurry and the sound blaring has good reason to believe that others in the audience feel the same way. Predicting the popularity of the movie is more difficult because experience suggests that there is more disagreement. Still, many perceivers assume that their own views are common. This perception of similarity need not be irrational; instead, the question is whether people rely as much on the reactions of individual others as they rely on their own when making predictions about the group. According to the social-projection hypothesis, other-referent information is rather neglected.

Our second research goal was to test some properties of self-referent and other-referent knowledge that may account for the suggested difference in social prediction. We assumed that self- and other-referent information is encoded differently. Direct phenomenal experience, which is interwoven with a person's own sense of self, is not available for the representations of others. People can observe others, listen to what they say, or read what they write, but they cannot directly experience their states of mind (e.g., their reactions to various stimuli). We assumed that (a) these experiential differences would make self-referent knowledge more accessible and temporally more stable than other-referent knowledge and that (b) these differences could account for the hypothesized self-other difference in prediction. We refer to these presumed mediational processes as the egocentric-encoding hypothesis.

The validity of the social-projection hypothesis is far from certain because of two countervailing factors. As noted above, stereotypic inferences may even play a larger role in perceptions of individual others than in perceptions of the self (Cadinu & Rothbart, 1996). If so, correlations between other ratings and group ratings may be larger than correlations between self-ratings and group ratings. This possibility arises especially when there are well-developed stereotypical beliefs about the group.

More important, people may reason inductively rather than egocentrically. If the induction hypothesis is true, people use whatever information they have about group members to infer group characteristics. Information about individual other group members can indeed alter beliefs (Hansen & Donoghue, 1977; Rothbart & Lewis, 1988; Sherman, Presson, & Chassin, 1984; Zuckerman, Mann, & Bernieri, 1982). To examine whether inductive reasoning can explain the findings commonly attributed to social projection, it is necessary to compare the use of self-referent and other-referent information directly. Our efforts to perform such comparisons began with studies in the bogus-stranger paradigm (BSP) (Clement & Krueger, 2000). In the BSP, participants are reluctant to generalize the characteristics of other individuals to the group. The question is whether this reluctance persists when the other person is familiar and liked. Before presenting new empirical work, we briefly review (a) the rationale for the induction hypothesis (i.e., the chief alternative to the social-projection hypothesis) and (b) the design and the findings of previous comparative studies (i.e., the BSP).

A Rationale for Induction

Hoch (1987) pointed out that inductive reasoning can explain the standard finding of social projection (see also Dawes, 1989, 1990). For any binomial attribute (i.e., the attribute is either present or not), a person is more likely to be in the majority than in the minority. Therefore, a person who does not know the actual prevalence of the attribute may predict that most people have it (if he or she has it) or do not have it (if he or she does not have it). This prediction strategy reduces the number of errors if it is applied consistently across attributes.

The induction hypothesis does not distinguish between self- and other-referent information because any information about the attributes of an individual group member is useful for inferences about group attributes. Just as the self can be regarded as a randomly selected group member, so can anyone else. This equivalence of self and other holds whenever the prevalence of group attributes is unknown. When the prevalence is known, the typicality of any individual person can be examined, and no inductive inferences are necessary. Given the statistical equivalence of self- and other-referent information, a person who reasons inductively makes predictions about group attributes that are equally well correlated with ratings of another individual as with his or her own self-ratings. In contrast, the social-projection hypothesis states that people rely mostly on self-ratings because these ratings enjoy the advantage of egocentric encoding.

Bogus Strangers

In the BSP, participants learn about the self-referent judgments of another group member. They then make self-referent judgments (e.g., agree vs. disagree) and judgments about a group (e.g., whether the majority of group members agrees) for a set of items, such as trait adjectives, attitude statements, or behavioral preferences. Contrary to the induction hypothesis, self-referent judgments predict group judgments about 3 times as well as other-referent information does (Clement & Krueger, 2000, Experiment 2).

Several features of this study are worth noting. First, the role of stereotypic inferences from perceived group attributes to an individual's attributes was minimized because group membership was determined by arbitrary feedback on a test of cognitive style. Second, the time at which the other-referent information was presented was varied. Some participants received this information after they viewed the stimulus attribute, whereas others received it before seeing the stimulus. This variation did not moderate the advantage of self-referent information, thus ruling out a simple primacy effect. Third, the same advantage was observed regardless of whether the other person was individuated (by a name and a brief personal sketch) or anonymous (represented only by a bogus student ID). Other studies showed that self-referent judgments remain the best predictors of judgments about the group even when information about multiple others is introduced (Alicke & Largo, 1995; Krueger & Clement, 1994).

Conclusions drawn from the BSP are limited by the fact that the other person is just that: bogus and strange. The possibility remains that people use information about other individuals when these others are real and familiar to them. In particular, students are highly familiar with their roommates, and they tend to like them. Thus, they may be inclined to generalize the perceived attributes of their roommates to the student body at the university. In other words, the roommate design favors the induction hypothesis and thus permits a strong test of its alternative, the social-projection hypothesis.

Processes Underlying Projection

The induction hypothesis rests on a simple statistical rationale and thus needs no further psychological explication. The social-projection hypothesis, however, requires assumptions concerning the mechanisms giving self-referent knowledge primacy in social estimates. Self-referent knowledge differs both qualitatively and quantitatively from other-referent knowledge. Qualitatively, the self is the locus of consciousness and direct phenomenal experience, whereas the experience of the other is highly inferential and mediated by observation (e.g., Wood & Cowan, 1995). Quantitatively, self-referent knowledge is more deeply encoded, more highly structured, and more readily accessible. Mostly, these differences can be traced to the greater frequency and recency with which self-referent knowledge is activated (Higgins & Bargh, 1987). Self-relevant information is nearly always present, whereas information relevant to others is constrained by the nature of the relationship with the other.

Kuiper and Rogers's (1979) experiment on the self-reference effect in memory is a particularly relevant study. Kuiper and Rogers proposed that self-reference enhances memory because it taps into a rich and highly accessible knowledge structure. For each of several trait adjectives, some participants decided if it described the self, whereas other participants decided whether these traits described the research assistant conducting the study. Although there was no difference in memory performance by the end of the semester (by which time the research assistant had become a familiar figure), self-referent judgments were still made faster, with less difficulty, and with greater confidence than were other-referent judgments. Adapting this paradigm to the study of social projection, we have found parallel differences between self-referent judgments and group-referent judgments (Clement & Krueger, 2000, Experiment 1). These findings suggested that people project from the self to the group rather than vice versa. Using a similar rationale, we now predict that self-referent judgments are faster, easier, more confident, and also more stable over time than are judgments about a familiar and liked other person. If these differences are controlled, differences in the use of self- versus other-referent knowledge for group ratings should be attenuated.

Overview of the Present Work

The overarching goal was to compare predictions derived from the social-projection hypothesis with predictions derived from the induction hypothesis. Study 1 examined the idea that self-referent information carries greater weight in group estimates than other-referent information does because self-referent information is more deeply encoded and more readily accessible. In Study 2, other-referent information was made more salient to increase perceived similarities between the other and the group. Study 2 also addressed (a) the effects of projection on predictive accuracy and (b) the question of whether students are more similar to their matched roommates than to randomly selected others.

STUDY 1

The test of the social-projection hypothesis against the induction hypothesis involved a statistical asymmetry. The social-projection hypothesis predicted a self-other difference, whereas the induction hypothesis did not. To avoid bias against the null hypothesis (Krueger, 1998b), we considered a small effect size (d = .2) as defined by Cohen (1988) to be a minimum requirement for the acceptance of the social-projection hypothesis.

The egocentric-encoding hypothesis generated two predictions: First, self-referent knowledge was expected to be more accessible and more stable than other-referent knowledge. Second, these differences in accessibility and stability were expected to account for differences in projection. A related question was whether judgments about others would be more accessible and stable than judgments about the group. We thought this possible

because the other person was familiar and well-known. At the level of individuation expected among roommates, it is likely that perceived similarities between the other and the group primarily reflect inductive inferences from the person (i.e., generalization) rather than stereotyping from the group.

To examine the stability of the three kinds of judgments (about the self, the other, and the group), each participant completed the procedures twice. Both times, participants performed a secondary task, which was either easy (low cognitive load) or difficult (high cognitive load). This load manipulation also permitted an exploration of the automaticity of projection and generalization.

Method

Participants. Undergraduate students (N= 163) participated in exchange for credit for a research requirement. The data of 11 participants were discarded because they were incomplete; the data of 1 participant were discarded because the response latencies were implausibly short (288 milliseconds). The remaining sample (97 women and 55 men, mean age = 18.4 years) consisted of students who lived with a roommate.

Materials. Twenty-four trait adjectives were selected from a source containing normative ratings regarding ease of comprehension, observability, and desirability (Rothbart & Park, 1986). Unfamiliar traits were excluded and the number of traits high versus low in observability and high versus low in desirability was balanced. Traits that were both readily observable and desirable were as follows: alert, courteous, meticulous, neat, persistent, and witty. Traits that were observable but undesirable were the following: argumentative, gluttonous, lazy, loud, insulting, and materialistic. Traits that were more difficult to observe and desirable were as follows: candid, humble, imaginative, individualistic, perceptive, and sensual. Finally, traits that were difficult to observe and undesirable were the following: boring, deceptive, discontented, intolerant, sly, and smug. The selection of these traits minimized the possibility that findings regarding social projection might be confounded with other social-perceptual biases (i.e., the actor-observer bias and the self-enhancement bias for differences in observability and desirability, respectively).

The presentation of the stimuli and the collection of the data were controlled by a program written in Superlab (Haxby, Parasuraman, Lalonde, & Abboud, 1993), which was run on Macintosh IIci computers with 14-inch monitors.

Procedure. Working in private cubicles, participants performed two tasks simultaneously. The primary task was to make judgments about each of three social targets (the self, one's roommate, and students at the university). Each trial began with a presentation of the target word (2 seconds) on the screen. When the target word disappeared, 1 of the 24 traits was presented. Participants pressed a green key (the letter *J* on the keyboard) if they believed the trait to be characteristic of the target or a red key (the letter *F*) if they did not. If there was no response after 10 seconds, that trial was considered invalid and the next trial began.

The secondary task required the rehearsal of an eight-digit number. Prior to each of the three blocks of 24 trials, the participant received a number to remember, which remained on the screen for 7 seconds. The number was the same digit repeated eight times (low load) or a string of random digits (high load). At the end of the block, participants were asked to recall as much of the number as possible. Within each randomized block of 24 trials, each trait was presented once, and each target was presented eight times. Before beginning the experiment proper, participants practiced the task. They performed three trials of the judgment task, followed by six trials with both tasks. In both load conditions, the string "12345678" was used for memory practice. After the memory and judgment tasks were completed, participants rated how difficult they found the rating task for each target (1 = *not difficult*, 8 = *very difficult*) and how confident they were that each set of ratings was correct (1 = *not confident*, 8 = *very confident*).

Each participant performed this procedure in a low-load and in a high-load condition. The order of the load conditions varied randomly across participants. Between the two phases of the experiment, participants completed a questionnaire for an unrelated experiment, which required approximately 15 minutes. At the conclusion of the experiment, participants responded to three questions directly assessing perceptions of similarity (1 = *not similar*, 8 = *very similar*). The first question was "How similar do you think you and your roommate are to one another?" The second question was "How similar would you say you are to the typical Brown student?" The third question was "How similar would you say your roommate is to the typical Brown student?" Finally, they rated how well they knew (8 = *knew very well*) and how much they liked their roommate (8 = *liked very much*). These measurements were taken to (a) ascertain whether students knew their roommates well and liked them and to (b) examine whether direct ratings of similarity were related to the correlational indices of perceived similarity (computed across traits for each participant).

Results

The cognitive load manipulation, although successful, did not qualify the findings reported below, and it is therefore ignored. All of the reported statistical tests had

151 degrees of freedom. For large test statistics (with $p < .001$), p is not reported.

Familiarity, liking, and similarity. Relative to the midpoint of the scale (4.5), participants indicated that they knew their roommates well ($M = 5.26$, $t = 5.62$) and that they liked them ($M = 5.95$, $t = 8.68$). These high ratings confirmed that roommates were regarded as real people, which was a condition necessary to set this study apart from work in the BSP. Consistent with previous reports (Krueger, 1998a), none of the direct ratings of similarity suggested projection. Participants rated both the self ($M = 4.19$, $t = 2.70$, $p < .01$) and the roommate ($M = 4.23$, $t = 2.16$, $p < .05$) as being somewhat dissimilar to the group. The rated similarity of the self and the roommate ($M = 4.55$) was near the midpoint, $t < 1$.

Social projection. The social-projection hypothesis was that ratings of group characteristics would be more closely related to self-ratings than to other ratings. To test this hypothesis, two Φ correlation coefficients were computed across the 24 traits for each participant. The projection correlation was between self-judgments and group judgments with judgments about the roommate being controlled. The generalization correlation was between judgments about the roommate and group judgments with self-judgments being controlled. Means were obtained after Φ -*Z*-Φ transformations. The social-projection hypothesis was supported, as shown by the difference between the two columns on the left of Figure 1, $d = .29$, $t = 3.59$. Most participants (69%, $p < .001$, two-tailed, against the null hypothesis of 50%) showed this predicted difference.

The difference between projection and generalization coefficients could have been artifactual if self-referent judgments were more variable than other-referent judgments. To examine this possibility, variability scores were computed as the absolute differences between the proportion of yes responses and the point of maximum variability (i.e., 50% yes). The restriction-of-range artifact was rendered improbable by the finding that self-judgments departed from maximum variability only to a trivially smaller degree ($M = 9\%$) than other judgments did ($M = 11\%$). In direct contradiction to the artifact account, the differences between the variability scores (self-other) were negatively correlated with the differences between projection and generalization ($r = -.19$, $p < .01$).

Because all judgments were made twice, two projection coefficients and two generalization coefficients were available for each participant. The two center columns in Figure 1 show that individual differences in projection were more stable than individual differences for generalization, $z = 2.91$, $p < .01$. If people applied inductive reasoning even-handedly to self- and other-referent

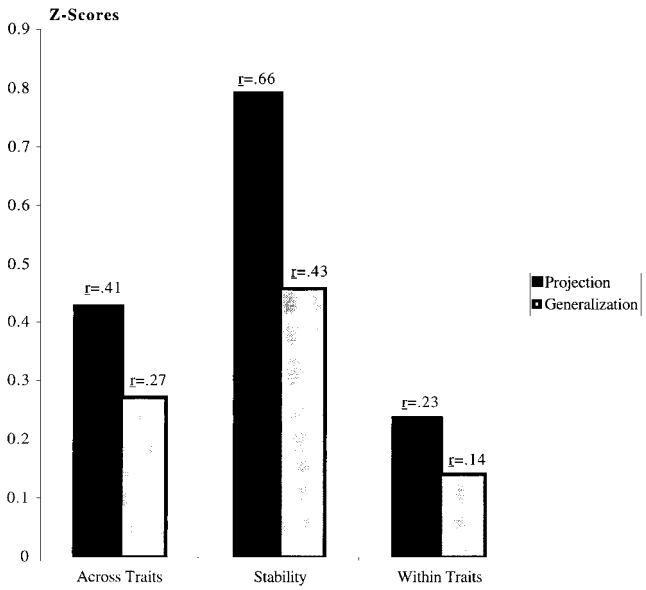

Figure 1 **Projection (from self) and generalization (from other) to the group: correlations within participants (left), the stability of the within-participant correlations (center), and correlations within traits (right).**

information, no such difference should occur. Moreover, projection and generalization coefficients were not positively correlated with one another ($r = -.15$).

As an alternative to the idiographic method (i.e., computing correlations for each participant), projection and generalization correlations were computed for each trait and across participants. As in the idiographic analysis, projection correlations controlled for other ratings and generalization correlations controlled for self-ratings. The two columns on the right of Figure 1 show that, as predicted, projection was greater than generalization, $t(23) = 4.36$, $d = .89$. This effect was present for most of the traits (79%), $p < .001$. The convergence of across-items and across-participants analyses was not surprising given prior mathematical (Dawes & Orbell, 1995) and empirical demonstrations (Dawes & Mulford, 1996; Krueger, 2000).

Egocentric encoding. We hypothesized that knowledge of the self is richer and more deeply encoded than knowledge of a familiar and liked person or knowledge of a group. The first test of this prediction involved response latencies. Analyses were performed on log (base 10) transforms of the latency measure, but for presentation, the average logarithms were transformed back to the regular time scale. As predicted, judgments about the self (Figure 2, top) were made faster than judgments about the other, $F = 93.00$, which in turn were made faster than judgments about the group, $F = 6.59$, $p < .05$. Self-judgments were also more stable across the

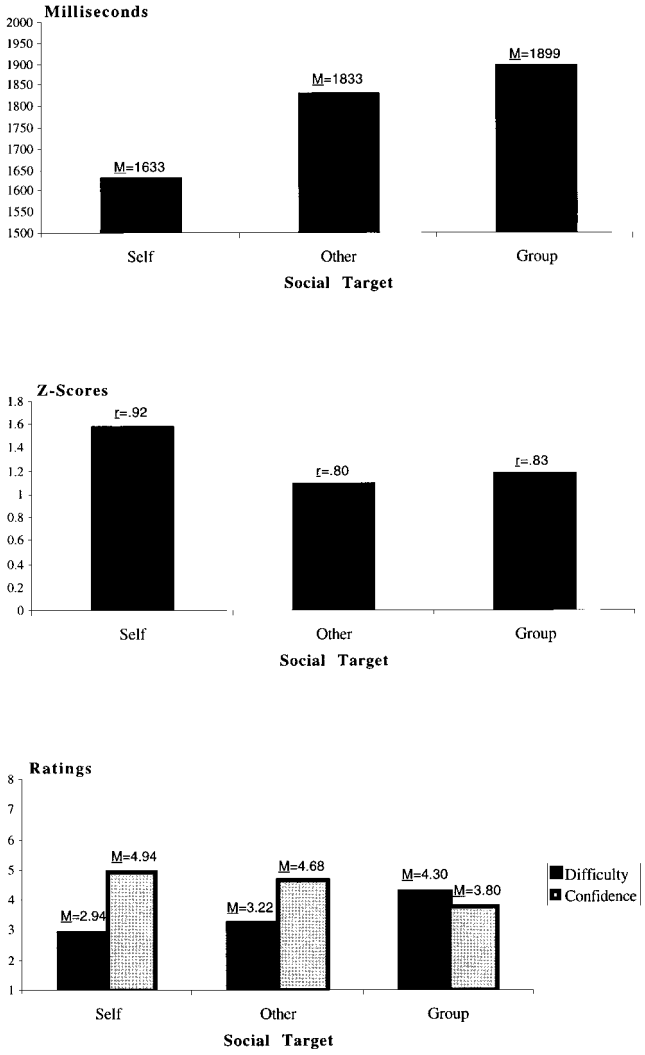

Figure 2 **Encoding differences between self, other, and group: latency (top), stability (center), difficulty (bottom: dark columns), and confidence (bottom: light columns).**

two assessment times (Figure 2, center) than either other judgments or group judgments (respective *F*s were 47.46 and 36.05).

Consistent with these results, self-judgments appeared less difficult than other judgments, $F = 6.33$, $p < .05$, which in turn appeared less difficult than group judgments, $F = 98.58$ (Figure 2, bottom). Confidence ratings showed a parallel pattern, with confidence being greatest for self-judgments, intermediate for other judgments, $F = 4.83$, $p < .05$, and lowest for group judgments, $F = 77.22$ (for the comparison between other and group).

Aside from documenting the primacy of self-referent knowledge, these data also showed that knowledge of the individual other is more accessible and stable than knowledge of the group. The first three comparisons (involving latency, difficulty, and confidence) showed statistically significant differences consistent with this view, whereas the fourth comparison (stability) yielded only a nonsignificant reversal.

TABLE 1: Correlations Between Idiographic Similarity Indices and Direct Ratings of Similarity, Familiarity, and Liking

	Direct Ratings of Similarity			
Correlational Index	*Self/ Group*	*Other/ Group*	*Familiarity*	*Liking*
Projection (self with group by other)	.27	.16	–.03	–.05
Generalization (other with group by self)	–.04	.34	.16	.27

NOTE: $df = 150$; $p = .05$ for $r = .16$, $p = .01$ for $r = .21$, and $p = .001$ for $r = .26$.

Egocentric encoding predicts projection. We had hypothesized that the process measures (latency, difficulty, confidence, and stability) would mediate self-other differences in predictive weight. The process measures, which were largely independent of one another (median $r = –.02$, maximum $r = .27$), were controlled one at a time, whereas the self-other differences in the idiographic (i.e., across traits) partial correlations were reexamined. When response latencies for the self and the other were matched covariates, judgments about the self no longer predicted judgments about the group better than judgments about the other did, $F < 1$. When stability coefficients were controlled, the relevant F value was greatly reduced, $F(1, 150) = 4.26$, $p < .05$. When ratings of difficulty or confidence were controlled, however, the respective F values (11.40 and 10.02) were hardly reduced. We suspect that these variables failed to play a mediating role because they were (a) derived from introspection and (b) represented by a single rating per person. Latency and the stability measures offered more direct reflections of psychological processes, and they were computed from multiple responses.

Linkages Between the Direct Ratings and the Idiographic Indices

Whereas direct ratings of similarity did not indicate projection, the correlational indices did. One interpretation of this finding is that people are not aware of their own processes of projection and induction. Table 1 lists the correlations between the projection and generalization coefficients and four of the direct ratings. Direct ratings of similarity were only related to their corresponding correlational index, suggesting that people possess modest insight into the way in which they constructed group ratings. This finding was also consistent with the induction hypothesis, which suggested that generaliza-

tion from instances should increase with the perceived typicality of these instances (Rothbart & Lewis, 1988).

The last two direct measures revealed that the perceived relevance of the roommate for group perception was mainly a matter of liking. The more the roommate was liked, the more his or her perceived characteristics predicted ratings of the group. This finding could not be explained by inductive reasoning because the correlation remained significant when the perceived typicality of the roommate was partialled out ($r = .22$, $p < .01$).

Discussion

Consistent with the social-projection hypothesis, judgments about the self predicted judgments about the group better than judgments about the other person did. Consistent with the egocentric-encoding hypothesis, differences in encoding efficiency (greater speed and stability of self-judgments) could account for this difference in predictive weight. Compared with earlier work in the BSP, the evidence was stronger because the other individual was real instead of bogus and familiar instead of strange. Still, it remained possible that the self-other difference in projection would disappear if the other person were highly individuated. Many social-perceptual biases (e.g., self-enhancement) weaken or even reverse when the other person is highly familiar, well liked, and visually salient (Alicke, Klotz, Breitenbecher, Yurak, & Vredenburg, 1995; Klar, Medding, & Sarel, 1996; Krueger, 1998c). The first goal of Study 2 was to examine whether other ratings would predict group ratings as well as self-ratings do if that other person was present and visible at the time of assessment. In other words, visual salience of the other person may be necessary for people to reason inductively. Relative to the findings of Study 1, this individuation hypothesis suggested that the use of other ratings would increase (not that the use of self-ratings would decrease).

Previous empirical research as well as mathematical simulations have shown that projection increases accuracy (Krueger, 1998a). The more perceivers project from themselves to the group, the more accurate their group ratings tend to be (provided that their own characteristics are indeed correlated with the characteristics of the group). This accuracy benefit is not limited to self-referent information. Group ratings should also become more accurate when perceivers rely on information available about other individual members. This, in a nutshell, is the justification of induction. Inferences from the particular to the universal reduce uncertainty and increase knowledge of that which has not been seen (Reichenbach, 1951). The second goal of Study 2 was to test the accuracy hypothesis by asking whether correlations between group ratings and actual group characteristics would decrease when self-ratings or other ratings were controlled.

Social projection is often attributed to the selective exposure to similar others (Marks & Miller, 1987). Because the selective-exposure hypothesis is a variant of the induction hypothesis, the final goal of Study 2 was to examine whether members of a living unit were more similar to one another than randomly paired students. Previous evidence for selective exposure has been mixed (Fuhrman & Funder, 1995; Funder, Kolar, & Blackman, 1995; Sherman, Presson, Chassin, Corty, & Olshavsky, 1983; Whitley, 1998). Testing the selective-exposure hypothesis was important in the present context because the induction hypothesis would be supported most strongly if people used other-referent information that is not biased toward self-referent information.

STUDY 2

Study 2 was designed as a conceptual replication and extension of Study 1. Its main objective was to examine whether the self-other difference in social prediction would emerge even when the other person was highly individuated through his or her actual presence in the assessment situation. It was further expected that the accuracy of group ratings would depend, in part, on their association with self- and other ratings. Finally, we examined whether the self-ratings of individual participants were more similar to the self-ratings of their respective roommates than to the self-ratings of another individual randomly drawn from the group.

Method

Participants. Residents of university dormitories (70 women and 50 men; mean age = 19.2 years) participated on a volunteer basis. Only dual-occupancy rooms were selected for this study, such that the participant pool consisted of 60 same-sex pairs of well-acquainted students.

Materials and procedure. A subset of the traits used in Study 1 was selected while keeping normative scores of observability and desirability independent. The adjectives *alert*, *meticulous*, and *neat* were both highly observable and desirable; the adjectives *argumentative*, *gluttonous*, and *loud* were observable and undesirable; the adjectives *candid*, *imaginative*, and *suggestible* were not very observable but desirable; and the adjectives *discontented*, *sly*, and *smug* were neither very observable nor desirable. The item "smoker" was added because it was used in a classic study of the selective-exposure hypothesis (Sherman et al., 1983). The item "Christian" was added because it produced a reversal of the consensus bias in previous research (Bosveld, Koomen, & van der Pligt, 1996).

All ratings were made on 8-point scales (1 = *not descriptive*, 8 = *very descriptive of the target*), and the order of the targets (self, other, group) was counterbalanced across pairs of participants. As in Study 1, participants also rated the similarities between the targets directly, and they rated how well they knew their roommates. Choosing among five ranked levels, participants finally judged the closeness of the friendship with their roommate. The lowest rank was that the roommate was "not among my 20 best friends," and the highest rank was that the roommate was "my best friend."

Participants were approached in their residences by an experimenter, usually in the evening, and asked to take part in a brief experiment. Participants completed the questionnaires quietly while being seated so that they could not view each other's responses. When both roommates had completed their responses, they were debriefed and the session was concluded.

Results

Neither the order of the tasks nor the sex of the participant was involved in any theoretically relevant effects. Both variables were therefore ignored. The reported statistical tests had 119 degrees of freedom.

The rated similarity of the self and the group was again below the midpoint of the scale ($M = 3.89$), $t = 4.63$, and so was the rating of the similarity between the roommate and the group ($M = 4.14$), $t = 2.78$, $p < .01$. The rated similarity between the self and the roommate ($M = 4.68$) did not depart from the midpoint, $t = 1.18$. The mean level of knowledge of the roommate was high ($M = 6.01$), $t = 12.29$, and the median friendship rating was that the roommate was "among my 10 best friends." Across participants, each of these ratings was most highly correlated with its corresponding idiographic correlational index (rs = .46, .21, and .21, for self-other similarity, projection, and generalization, respectively).[1]

The social-projection hypothesis was not supported by its primary test because self-ratings (with other ratings being controlled; $M = .24$) did not predict group ratings better than other ratings did (with self-ratings being controlled; $M = .25$). Self-ratings (mean standard deviation = 2.17) were no more variable than other ratings (M = 2.54), thus making a further search for restriction-of-range effects unnecessary.

Contrary to the individuation hypothesis, the equal predictive power of self- and other ratings did not appear to stem from the roommates' increased visual salience. Instead, the predictive power of self-ratings decreased relative to Study 1 ($M = .41$). Trait-by-trait analyses again lent converging evidence. Self-ratings (M = .17) predicted group ratings no better than other ratings did ($M = .14$), $t < 1$, a result attributable to a drop in the correlations involving self-ratings ($M = .23$ in Study 1). Further evidence against the induction paradigm came from the negative correlation between participants' projection and generalization coefficients ($r = -.15$; see also Study 1; Kenny & Acitelli, 2001; Schul & Vinokur, 2000). In contrast to this finding, the notion of induction suggests that the more people project from themselves, the more they also generalize from others.

The accuracy hypothesis was that group ratings would be less accurate if participants ignored their own characteristics or their roommates' characteristics. Baseline accuracy scores were computed by correlating group ratings with the average self-ratings obtained in this group ($M = .49$).[2] The hypothesis was tested by computing accuracy correlations while controlling either self-ratings ($M = .35$) or other ratings ($M = .38$). As predicted, both these averages were lower than the average zero-order accuracy correlation (ps < .001). The accuracy benefit of projection accrued because self-ratings ($M = .62$) and other ratings ($M = .56$) were valid predictors of actual group characteristics (here, the averages of the self-ratings). Other ratings yielded an accuracy benefit in part because they were closely related to self-ratings. Indeed, perceived similarities between the self and the other ($M = .52$) exceeded actual similarities ($M = .41$), $t = 3.42$. This finding supported the idea that people also project to other individuals.

The accuracy hypothesis was also examined across participants. Group ratings were the more accurate the more participants projected ($r = .63$) and the more their own self-ratings were actually associated with average self-ratings in the group ($r = .34$, both ps < .001). This latter correlation fell below significance when projection coefficients were controlled (partial $r = .13$, $p > .10$). In other words, students who were typical of the group at large made more accurate group ratings only because they projected. Correlations involving the roommate closely paralleled these findings. Group ratings were the more accurate the more participants generalized from other ratings ($r = .57$) and the more their other ratings were associated with average self-ratings ($r = .27$, $p < .01$). That correlation was no longer significant when the generalization coefficients were controlled ($r = .09$).

The third and last question was whether the observed similarities between matched roommates ($M = .41$) were biased by selective exposure. A baseline similarity index was computed by averaging all possible pairwise correlations of self-descriptions (Kenny & Acitelli, 1994). Statistically, actual roommates were no more similar to one another than one would expect by chance ($M = .36$), $t = 1.71$. Trait-by-trait analyses were performed by correlating self-ratings across pairs of roommates. These analyses also failed to support the selective-exposure hypothesis ($M = .05$), $t(13) = 1.34$. These findings were the same for students who had chosen their roommates ($n = 50$)

and for students who had been assigned roommates by the university ($n = 70$). The only difference was that the selectors reported knowing each other better than the assignees did, and they reported being closer friends (both ps $< .01$).

Discussion and Further Analysis

When students faced a well-liked and familiar group member, self-ratings and other ratings predicted group ratings equally well, and both increased the accuracy of group ratings by the same amount. We had expected the increased individuation of the other person to be the crucial factor. Increased individuation, we thought, would trigger stronger generalizations from other ratings to group ratings while leaving projection the same. A comparison between the findings of Study 1 and Study 2 suggested, however, that the underlying process was a different one.

The visual salience of the roommate did not increase generalization coefficients, but it decreased projection coefficients. The moderating role of social categorization could account for this finding. When small, proximal groups become the salient units of social categorization, projection to more inclusive groups decreases. In one test of this hypothesis, students in a highly interactive seminar made ratings for this proximal group and for the larger group of university students. At the beginning of the semester, self-ratings predicted ratings for both groups equally well; by semester's end, however, only projection to the proximal group remained high. Projection to students at large was cut in half, as if students no longer considered the inclusive group to be a relevant ingroup (Krueger & Clement, 1996, Experiment 3). Time-consuming processes of group formation and identification are not necessary for this effect to occur. A simple order manipulation is sufficient. In an experiment using minimal laboratory groups (based on arbitrary feedback on a test), participants projected less to the inclusive population of students when their own assignment to a minimal group preceded rather than followed the population rating task (Krueger & Clement, 1996, Experiment 2).

The situation in the present studies was analogous. Students may have considered the university population to be a relevant ingroup when no other, more immediate ingroup was salient to them (Study 1). When the presence of the roommate made a more local grouping salient, projection to the larger group dropped. The data of Study 2 offered an opportunity to test the social-categorization hypothesis directly. We assumed that the living unit was a more salient category to students who had chosen their roommates than to those who had been assigned. As expected, the choosing (and the chosen) students projected less to the group ($M = .32$) than the assigned students did ($M = .46$), $t = 2.22$, $p < .05$. At the same time, the perceived similarities between the self and the roommate were about the same (Ms = .50 and .54, for the chosen and the assigned students, respectively), $t < 1$.[3]

The moderating role of social categorization also had predictable consequences for the accuracy of the group ratings. Accuracy should diminish when perceived similarities between the person (self or other) and the group diminish. If, as suggested by the reduction in projection, active choice of roommates diminished the salience of the group at large, accuracy should also fall. This was the case. Group ratings were less accurate among the chosen ($M = .42$) than among the assigned students ($M = .54$), $t = 2.23$, $p < .05$.

A final analysis addressed the question of whether the actual similarity of roommates predicted the level of reported friendship. According to the similarity-breeds-liking hypothesis, this should be so (Byrne, 1997). In contrast, the projection hypothesis suggested that liking would mainly depend on perceived similarity. The data were more consistent with the projection hypothesis. Although level of friendship was not predicted well by either perceived similarity ($r = .17$, $p < .10$) or actual similarity ($r = .12$, $p > .20$), the correlation with actual similarity completely disappeared when perceived similarity was controlled ($r = .02$).

CONCLUSIONS

This research was motivated by the need to examine the sources of social projection. Predictions derived from two different theories were contrasted. According to one theory, projection is an egocentric process that leads to specific biases. According to the other theory, projection is nothing but an instance of a generic learning mechanism, namely, the induction of group properties from sample properties. The two theories converge on many of the same predictions. Both predict, for example, that self-ratings and group ratings are positively correlated and that the size of this correlation is related to the accuracy of the group ratings.

To discriminate between the two theories, we asked whether people would rely more on self-referent than on other-referent information when making judgments about the group. This self-other difference was found in Study 1 and traced to parallel differences in the speed and the stability of the judgments. This pattern of results suggested that social projection is, at least in part, egocentric. According to the induction hypothesis, there should have been no self-other difference in predictive weight. When asked directly, the participants themselves maintained that they were no more typical of the group than their roommates were.

The design of Study 2 improved the odds for the induction hypothesis by allowing participants to see their roommates as they were making their judgments. This change of procedure was meant to stimulate greater generalization from other-referent information. Instead, projection from the self decreased, which is a shift that we attributed to a change in social categorization. It is doubtful that the disappearance of the difference between projection and generalization reflects a return to normative inductive reasoning. First, the generalization coefficients were low in both studies. Although statistically significant, these partial correlations failed to realize the full accuracy benefit. The accuracy of group estimates increases as projection (or generalization) approaches the person's (self or other) validity coefficient. If, for example, the actual similarity between the characteristics of an individual person and the characteristics of the group is .6 (as in the present studies), projection and generalization coefficients are optimal if they are as high. Mean zero-order projection coefficients were .54 in Study 1 and .43 in Study 2, and the respective generalization coefficients were .43 and .41. In other words, only projection in Study 1 was at the level suggested by the students' own validity coefficients. The relative neglect of other-referent information in making group ratings seems to be the real bias, not the fact that people project from the self.

Second, the effects of other, uncontrolled social-perceptual biases worked against the social-projection hypothesis. When judging their own characteristics, people allow more situational variability than when judging the characteristics of others (Krueger, Ham, & Linford, 1996). Personality traits in particular are more readily attributed to other people, which is a finding that is widely recognized as a "correspondence bias" (Gilbert, 1998). If the prevalence of a trait in a group is to be judged, those group members to whom the trait has been firmly attributed (i.e., other individuals) would appear to be the most relevant sample observations (yet this does not happen).

Third, analyses in both studies focused on the variance in the group ratings that was uniquely explained by self-ratings or other ratings. The use of partial correlations as indices of projection and generalization to the group ignored the covariation of the two predictor variables. Self-ratings and other ratings were closely related in both studies, which means that some of the variance in the group ratings was explained jointly. If self-referent knowledge is more accessible than other-referent knowledge (Study 1), it seems likely that projection rather than generalization accounts for most of the joint variance in the group ratings (see Marks, Graham, & Hansen, 1992, for a similar argument).

A methodological limitation of the present work was that some of our conclusions could only be reached by comparing findings across studies. Study 1 involved more traits and a simpler response format than Study 2. These changes, although minor, violated the ideal of operational constancy. Preferably, an experiment will be conducted in which some participants perform the judgment tasks in the presence of their roommates, whereas randomly chosen others do so in isolation.

Another, deeper limitation was conceptual in nature and concerned the qualitative differences between self- and other-referent information. Whereas some of the quantitative differences were controllable by experimental design or statistical analysis, qualitative differences were not. The experience of taking another person's perspective truly, rather than only empathetically, is (at least thus far) the domain of fanciful film making (as in *Being John Malkovich*) or dubious practices of hypnosis. If it were possible to eliminate qualitative differences in self- and other perception fully and believably, differences between projection and generalization might also vanish. But again, such a finding would only support the social-projection hypothesis because processes of generalization would then also be egocentric.

NOTES

1. The complete correlation matrix is available from the authors.
2. Although the participating dormitory residents were not a random sample of the university's student population, we accepted the average self-ratings as being sufficiently representative of the group at large. Brown University is a residential campus with very few students residing outside the dormitory system.
3. An unresolved question is why the generalization from the other to the group did not diminish when the local living unit was the salient category. Either projection from the self is uniquely sensitive to social categorization or the relatively low level of generalization from the other in Study 1 resulted in a floor effect.

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